

Testing of bitumen and polymer bitumen sheeting and felts

DIN
52 123

Prüfung von Bitumen- und Polymerbitumenbahnen

Supersedes

DIN 52 123 Part 1, March 1977 edition
and

DIN 52 123 Part 2, March 1977 edition.

In keeping with current practice in standards published by the International Organization for Standardization (ISO), a comma has been used throughout as the decimal marker.

Dimensions in mm

For general tolerances, accuracy grade g as specified in DIN 7168 shall apply.

1 Field of application

This standard applies to testing for compliance with the requirements placed on:

- sealing sheeting for the waterproofing of buildings and structures, as specified in DIN 18 190 Parts 1 to 5;
- bitumen roofing felt with fibre base, as specified in DIN 52 128;
- uncoated bituminous sheeting, as specified in DIN 52 129;
- bitumen roofing felt with glass fleece base, as specified in DIN 52 143;
- roofing felts and fusion welding sheeting of bitumen and polymer bitumen, as specified in DIN 52 130, DIN 52 131, DIN 52 132 and DIN 52 133.

To test the impregnation, a specimen, about 100 mm wide and extending over the whole width of the sheet, shall be cut out from each test piece. The specimens shall be torn across the whole width of the sheet in such a way that as much as possible of the inner surface is exposed. The inner surfaces shall be inspected for unimpregnated areas.

5 Testing of thickness

The thickness shall be measured over the entire area at 10 points, distributed at equal intervals over the width of the sheeting, using a hand-operated thickness gauge having a flat gauging surface 10 mm in diameter and a contact force of 1 N to 1,2 N.

2 Designation

Designation of a comprehensive test as required by this standard (A):

Test DIN 52 123 – A

6 Testing of the content of soluble matter

(see also Appendix A)

6.1 Preparation of specimens

A strip at least 100 mm long and extending over the whole width of the sheet shall be taken from each test piece. Three specimens, each 100 mm X 100 mm, shall be taken from each strip, two of them from points 100 mm from each end of the strip and one from the centre (individual specimens). These three specimens shall be tested together (collective specimen).

6.2 Procedure

6.2.1 The content of soluble matter shall be determined by extraction. Additionally, subclause 6.2.2 shall apply for the examination of uncoated bituminous sheeting. The specimens shall be lightly brushed prior to extraction, in order to remove loosely adhering mineral substances. Extraction thimbles as specified in DIN 12 449 shall be used for the extraction process. Together with a wad of cotton wool as a stopper, they shall be dried at about 105 °C to constant mass, cooled to ambient temperature (18 to 28 °C in accordance with DIN 50 014) in a desic-

3 Sampling

In the case of consignments of

- up to 250 rolls, take 2 rolls
- over 250 up to 500 rolls, take 3 rolls
- over 500 up to 1000 rolls, take 4 rolls
- over 1000 rolls, take 5 rolls

of each kind at random for testing. A test piece 1,5 m long shall be cut out over the whole width of the sheeting from the middle section of each roll. The upper surface of the test piece shall be marked. Test pieces shall be packed for dispatch so that they can be neither creased nor otherwise damaged.

4 Testing of the external condition and of impregnation

Test pieces shall be inspected visually to see whether their external condition conforms to the requirements.

Continued on pages 2 to 6

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cator over calcium chloride or blue gel and, after removal from the desiccator, weighed to the nearest 0,01 g.

The three specimens taken as described in subclause 6.1 shall be inserted into the thimble; the thimble shall be sealed with the wad of cotton wool and immediately weighed to the nearest 0,01 g.

Exhaustive extraction shall then take place in an extraction device, that is to say, until the solvent running off is colourless. For this purpose, the following shall be used as a solvent:

- for bituminous sheeting: trichlormethane, trichlorethylene or toluene (methylbenzene);
- for sheeting of polymer bitumen: toluene.

When the solvent has dripped off, the thimble is to be dried at about 105 °C to constant mass and, after being cooled in the desiccator, is to be reweighed at ambient temperature to the nearest 0,01 g. The loss of mass in g shall be multiplied by 100/3, giving the content of soluble matter per unit area, in g/m².

6.2.2 In the case of uncoated bitumen sheeting as specified in DIN 52 129, the extraction procedure shall be carried out on the lines of subclause 6.2.1. The quantity of impregnating material determined is expressed as a percentage by mass of the mass of fibre felt extracted.

7 Testing of the base

7.1 Mass per unit area

A soft paintbrush shall be used to remove any particles adhering to the three specimens of base material remaining after the determination of the content of soluble matter as described in clause 6 or in Appendix A, subclause A.3. The specimens shall then be dried in an open weighing glass of 60 mm diameter and a height of 120 mm, at about 105 °C until constant mass is reached and, after cooling in a desiccator, weighed in a closed weighing glass to the nearest 0,01 g. After the weighing glass has been opened with a pair of tweezers and the three specimens taken out with the tweezers, the weighing glass and lid shall be reweighed. The difference between the two weighings is the weighing result in g, which shall be multiplied by 100/3 to give the mean mass per unit area of the base, in g/m².

In the case of fibre felt, 9 % is to be added to the mass per unit area ascertained, to allow for the normal moisture content of fibre felt. The result is the mean mass per unit area of the processed fibre felt.

In the case of hessian, 16 % is added to the mass per unit area ascertained, to allow for the normal moisture content of hessian. The result is the mean mass per unit area of the processed hessian.

In the case of textile glass fabric obtained by extraction, the mass determined after drying and subsequent calcination (in accordance with ISO 1887 for 30 minutes at about 600 °C) shall be deemed to be the mean mass per unit area of the processed raw unfinished glass fabric.

7.2 Sett of hessian

The sett shall be determined in the direction of the warp and weft over a length of 100 mm, as specified in DIN 53 853.

8 Determination of the granulometric composition of the mineral surfacing

The mineral substances obtained in the course of determining the content of soluble matter in accordance with clause 6 shall be placed on a set of sieves consisting of woven wire test sieves of sizes 1, 0,71, 0,25 and 0,09 mm as specified in DIN 4188 Part 1. After sieving for at least 10 minutes in a vibrating machine, the proportions of particle sizes in the mineral surfacing of over 1,0 mm, 1,0 mm to 0,71 mm, 0,71 mm to 0,25 mm and 0,25 mm to 0,09 mm shall be ascertained by weighing to the nearest 0,1 g. The percentage of the individual particle sizes in the mineral surfacing shall be calculated and stated to the nearest 0,5 %. Particle size 0 to less than 0,09 mm is to be regarded as a filler.

9 Determination of mineral fillers in the covering

This test shall be carried out only if the quantity of filler determined in accordance with clause 8 is more than 10 % of the content of soluble matter as described in subclause 6.2.

About 5 g of the filler that has been separated as specified in clause 8 by sieving with the 0,09 mm wire cloth test sieve to DIN 4188 Part 1, and that has been dried at (105 ± 2) °C to constant mass, are weighed to the nearest 0,001 g, placed in a DIN 12 331 – HF 600 beaker and mixed with 200 ml of hydrochloric acid having a 5 % part by mass of *w* (HCl) and a density ρ_{20} of 1,023 g/cm³. The beaker shall be allowed to stand for about 24 hours, while being swirled frequently. The undissolved fraction shall then be collected on a weighed filter. Following rinsing out with distilled water, the residue, together with the filter, shall be dried at (105 ± 2) °C to constant mass, weighed and the mass of the filter deducted. The content of soluble matter shall be calculated from the residue on the filter and expressed as a percentage of the initial mass.

10 Testing of imperviousness to water

10.1 Bitumen felts complying with DIN 52 128 and DIN 52 143

The test shall be carried out according to the Tröger method.

Two specimens, 250 mm in diameter, are to be placed on glass plates of equal size resting on a frame some 400 mm high. A coating of paraffin, 15 mm wide, is to be applied to the upper surface of the specimens, about 10 mm from the edge. Two metal rings with an internal diameter of 200 mm and a height of 130 mm, and having a ground lower edge some 10 mm wide, are to be heated to between 70 and 90 °C and placed on the paraffin border of each of the specimens, whereupon they immediately adhere to the specimens. To produce a reliable seal, a further paraffin coating may be applied from outside. Water shall be poured into the ring up to a height of 100 mm. The underside of the specimens shall be observed for a 72 hour test period for damp areas or the formation of drops.

If only one specimen displays damp areas or the formation of drops, two further specimens shall be tested. The result of this test shall then be determining.

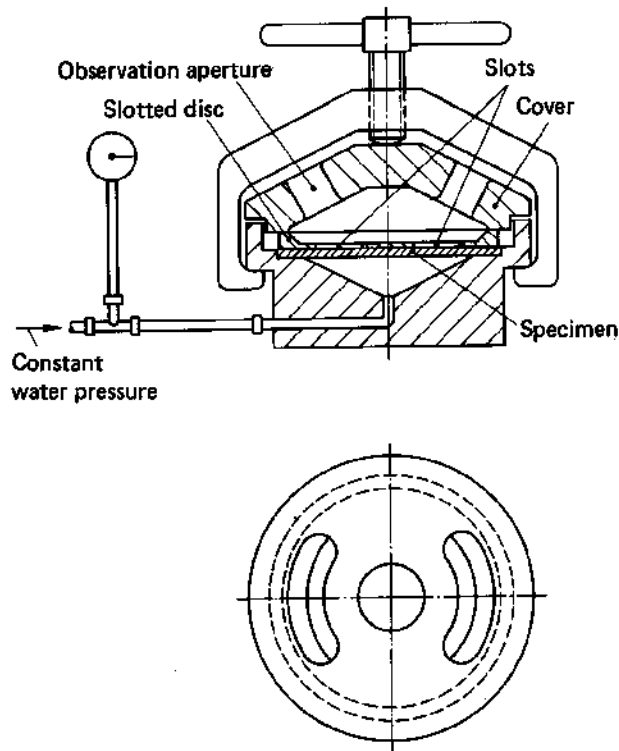


Figure 1. Slot pressure test apparatus

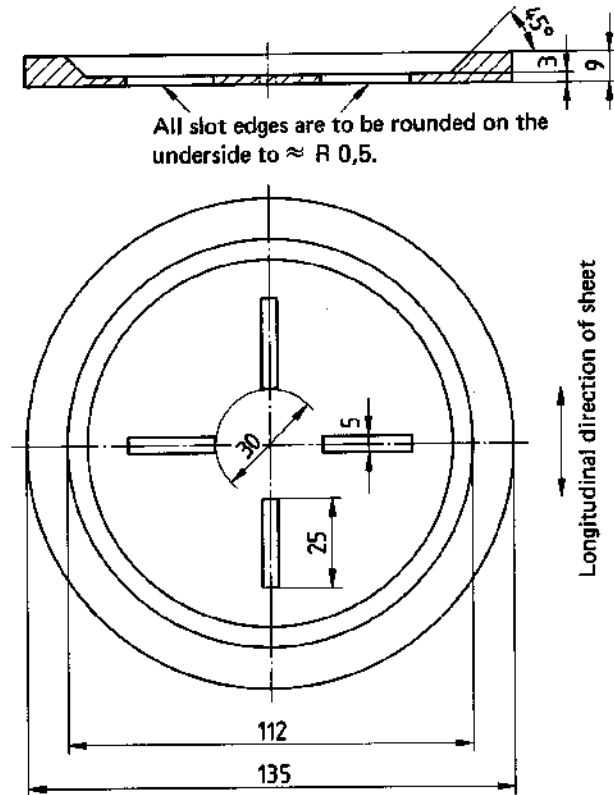


Figure 2. Slotted disc

10.2 Bitumen sheeting and felts complying with standards of the DIN 18 190 series, with DIN 52 130 and DIN 52 131 and polymer bitumen sheeting and felts complying with DIN 52 132 and DIN 52 133

The slot pressure test shall be applied to these types of sheeting.

Three specimens, the diameter of which shall correspond to that of the slotted disc in figure 2, shall be taken from points uniformly distributed over the width of the sheeting and at a distance of at least 100 mm from the longitudinal edge of the sheet.

The longitudinal direction of the sheeting shall be marked on the specimens. Each specimen, together with the slotted disc as shown in figure 2, shall be placed in the test apparatus depicted in figure 1 (see figure 2 for the positioning of the slots in relation to the longitudinal direction of the sheeting) and clamped in the test apparatus.

In the case of sheeting surfaced with mineral substances, the granule surfaced side — in the case of mineral granule surfaced sheeting, the side with the coarser mineral granules — shall be placed so that it faces the water.

After exposure to water at a temperature of $(23 \pm 2)^\circ\text{C}$, at the pressure and for the period specified for the sheeting in question, a check shall be made of whether water has penetrated through the specimen.

11 Testing of maximum tensile force and of elongation at maximum tensile force

5 specimens, 50 mm wide, shall be taken from each test piece in a longitudinal and transverse direction — also, in the case of sheeting with a polyester fleece base, diagonally (at an angle of 45° to the longitudinal edge of the sheeting). In the case of sheeting with a hessian or glass fabric base and with bases made of yarn-reinforced fleece, care shall be taken that the specimens are cut out in the direction of the thread. To this end, the covering compound adjoining the points from which the specimens are to be taken shall be abraded over a width of about 20 mm, to permit the run of the thread to be identified. The specimens themselves shall not be damaged thereby.

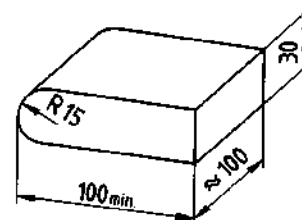


Figure 3. Bending plate 15